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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/035,564	10/26/2001	Robert Sabia	SP01-301	5440

22928 7590 07/31/2003

CORNING INCORPORATED  
SP-TI-3-1  
CORNING, NY 14831

EXAMINER
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ROSSI, JESSICA

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 07/31/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/035,564

Applicant(s)

SABIA, ROBERT

Examiner

Jessica L. Rossi

Art Unit

1733

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2-5. 6) ☐ Other: .

**DETAILED ACTION**

*\*Please note that the last claim was misnumbered as claim 22 when it should be claim 21.*

*Applicants are asked to correct this in the response to the present office action.*

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 7, it is unclear as to how this claim further limits claim 3 from which it depends. According to the specification, “high pH” means that the pH is greater than 8 (p. 7, [00011]). Therefore, when interpreting claim 3 in light of the specification, “high pH” means pH greater than 8. If Applicants intend for this limitation to include pH’s greater than 7 but less than 8, please note that no such support is provided in the specification. Applicants are asked to clarify. It is suggested to delete claim 3 and make claim 7 dependent on claim 1.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3, 7-8, 11-12, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Eda (US 5785874; provided in IDS).

Art Unit: 1733

\*Please note that the present invention provides the claimed functional groups on the surfaces of the silicon-containing substrates (i.e. glass) by treating each with an acidic solution, a basic solution, and pure water in this order (see specification p. 10, [00025]).

With respect to claim 1, Eda is directed to making an optical waveguide by directly bonding two silicon-containing (glass) substrates 2, 14 (Figure 14). Prior to bonding, the surface of each substrate is cleaned, contacted with an acidic solution (i.e. HF), contacted with a basic solution (i.e. ammonia/hydrogen peroxide), and contacted with pure water in this order (column 14, line 63 - column 15, line 10). Therefore, the skilled artisan would have readily appreciated that the treated surfaces of Eda would have the presently claimed functional groups thereon.

Regarding claim 2, Eda teaches maintaining the substrates at a temperature less than 300°C during bonding (column 16, lines 1-2).

Regarding claim 3, the skilled artisan would have appreciated that ammonia/hydrogen peroxide is an alkaline solution and therefore would have a high pH.

Regarding claim 7, the skilled artisan would have appreciated that ammonia/hydrogen peroxide would have a pH greater than 8.

Regarding claim 8, Eda teaches contacting the surfaces with the ammonia/hydrogen peroxide takes place after contacting the surfaces with the acid (column 15, lines 1-4).

Regarding claim 11, Eda teaches rinsing the surfaces with pure water and placing them in contact without drying (column 15, lines 8-9 and 22-27).

Regarding claim 12, Eda teaches maintaining the substrates at a temperature less than 300°C during bonding (column 16, lines 1-2).

Art Unit: 1733

Regarding claim 15, Eda teaches the substrates being an optical waveguide (column 14, lines 59-60).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eda in view of Landrock (Adhesives Technology Handbook).

Regarding claim 4, Eda teaches cleaning the surface of each substrate prior to treating them with the acid solution but is silent as to particular cleaning agents (column 14, lines 63-64; column 15, lines 18-19). It is known in the art to clean the surfaces of glass substrates prior to treating them with an acid solution, as taught by Landrock (p. 117-118). It would have been obvious to the skilled artisan at the time the invention was made to clean the surfaces of the glass substrates of Eda with a detergent because such is known, as taught by Landrock, and this would remove unwanted contaminants.

7. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eda and Landrock as applied to claim 4 above, and further in view of Shiono et al. (P2000-56265A; provided in IDS).

Regarding claim 5, Eda teaches grinding the substrates but is silent as to polishing (column 16, lines 55-60). It would have been obvious to the skilled artisan at the time the invention was made to polish the substrates after grinding because polishing glass substrates

Art Unit: 1733

prior to treating their surfaces with acidic and basic solutions is known, as taught by Shiono (p. 7, [00021]), and this improves the appearance of the finished product.

Regarding claim 6, selection of a particular flatness would have been within purview of the skilled artisan at the time the invention was made depending on the desired specifications of the finished product.

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eda and Landrock as applied to claim 4 above, and further in view of Rangsten et al. (Journal of the Electrochemical Society; provided in IDS).

Regarding claim 9, Eda is silent as to the acidic solution being  $\text{HNO}_3$ . Selection of a particular acidic solution would have been within purview of the skilled artisan depending on the type of silicon-containing substrate used, as suggested by Eda (column 15, lines 1-8). However, it would have been obvious to use  $\text{HNO}_3$  because such is known in the silicon-containing substrate art wherein the substrate is surface treated to promote bonding, as taught by Rangsten (p. 1104).

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eda, Landrock, and Rangsten et al. as applied to claim 9 above, and further in view of Shin et al. (Thin Solid Films; provided in IDS).

Regarding claim 10, Eda is silent as to the basic solution being one of those claimed in the present invention. Selection of a particular basic solution would have been within purview of the skilled artisan depending on the type of silicon-containing substrate used, as suggested by Eda (column 15, lines 1-8). However, it would have been obvious to use one of the solutions

Art Unit: 1733

claimed in the present invention because such is known in the silicon-containing substrate art wherein the substrate is surface treated to promote bonding, as taught by Shin (p. 170).

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eda as applied to claim 12 above, and further in view of Sayah et al. (Sensors and Actuators; provided in IDS).

Regarding claim 13, Eda is silent as to bonding with pressure. It would have been obvious to bond the substrates of Eda using pressure because such is known the art where two surface-treated glass substrates are bonded to each other, as taught by Sayah (p. 106-107, section 4.3), and this eliminates voids between the substrates (Sayah). Selection of a particular pressure would have been within purview of the skilled artisan at the time the invention was made.

11. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eda as applied to claim 11 above, and further in view of Ramsey et al. (US 6129854; provided in IDS).

Regarding claim 14, Eda teaches heating to remove water molecules and hydroxyl groups from the surfaces (column 15, lines 27-33) but is silent as to using vacuum. It would have been obvious to bond the substrates under vacuum because such is known in the art where two silicon-containing surfaces are treated prior to bonding them to each other, as taught by Ramsey (column 6, lines 20-22), and this would prevent air entrapment between the substrates.

12. Claims 16-17 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eda in view of Landrock, Shiono et al., and Vines et al. (US 6429144).

\*Please note that the present invention does not claim a particular sequence for the method steps.

With respect to claim 16, all the limitations were addressed with respect to claims 1, 4-5, and 7, except contacting the opposing surfaces with an aqueous rinse solution. One reading the



Art Unit: 1733

Eda reference as a whole would have appreciated that the particular cleaning process used is not critical to the invention (column 14, lines 63-64). Therefore, since it is known in the art clean the surface of a silicon-containing substrate with an aqueous solution prior to treating the same with an acidic solution, as taught by Vines (Figure 1; column 3, lines 21-22), it would have been obvious to clean the surfaces of the substrates of Eda prior to contacting the same with the acidic solution because such is known in the art, as taught by Vines, and this would further aid in removal of contaminants.

Regarding claim 17, Applicants are directed to claim 2 above.

Regarding claim 21, Applicants are directed to claim 1 above.

13. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eda, Landrock, Shiono et al., and Vines et al. as applied to claim 17 above, and further in view of Sayah et al.

Regarding claim 18, Applicants are directed to claim 5 above.

14. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eda, Landrock, Shiono et al., and Vines et al. as applied to claim 18 above, and further in view of Rangsten et al.

Regarding claim 19, Applicants are directed to claim 9 above.

15. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eda, Landrock, Shiono et al., Vines et al., and Rangsten et al. as applied to claim 19 above, and further in view of Shin et al.

Regarding claim 20, Applicants are directed to claim 10 above.

16. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. (WO 01/73831, published 10/4/01; refer to US 6,583,029 for text) in view of Landrock and Vines et al.

Art Unit: 1733

\*Please note that the present invention does not claim a particular sequence for the method steps.

With respect to claim 16, Abe is directed to treating the surfaces of two silicon wafers and directly bonding them to each other (column 1, lines 7-8; column 4, lines 44-45). The reference teaches polishing the surface of each wafer (column 5, lines 66-67), contacting the surface of each wafer with an  $\text{HNO}_3$  solution (column 5, lines 57-58), contacting the surface of each wafer with a solution having a pH greater than 8 (i.e. KOH, see column 6, lines 4-6, or NaOH, see column 12, lines 63-66), and contacting the treated surfaces of the substrates (column 6, lines 45-49; column 10, lines 23-26); note that the present invention uses  $\text{HNO}_3$  and KOH (or NaOH) as the acidic and basic solutions, respectively. The reference is silent as to contacting the surfaces with a detergent and an aqueous rinse solution.

It is known to clean the surfaces of two silicon-containing substrates prior to treating the same with an acidic solution and bonding the same, as taught by Landrock (see above) and Vines et al. (see above). It would have been obvious to clean the surfaces of the substrates of Abe with a detergent and an aqueous rinse prior to treating the same with the acidic solution because such is known in the art, as taught by Landrock and Vines, respectively, and this removes any contaminants from the surfaces that could interfere with the treating and bonding steps.

17. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimoto et al. (US 6030883) in view of Abe et al. and Landrock.

\* Please note that the present invention does not claim a particular sequence for the method steps.

Art Unit: 1733

With respect to claim 16, Nishimoto is directed to treating the surfaces of two silicon-containing substrates prior to directly bonding the same. The reference teaches contacting the surfaces with an aqueous rinse solution (column 2, lines 56-60). Since this aqueous solution can be acidic, the reference also teaches contacting the surfaces with an acidic solution. The reference then teaches contacting the opposing surfaces of the substrates to each other and dropping an alkaline solution (KOH, NaOH, or NH<sub>4</sub>OH) having a pH greater than 8 between the contacted surfaces and applying pressure to bond them together (Figures 1a-1d; abstract; column 2, lines 14-17 and 29-35; column 2, line 65 – column 3, line 2). The reference is silent as to polishing the surfaces and contacting the surfaces with a detergent.

It would have been obvious to polish the surfaces of the substrates of Nishimoto because such is known in the art of directly bonded silicon-containing substrates, as taught by Abe (see above), and this enhances the appearance of the finished product.

It would have been obvious to clean the surfaces of the substrates of Nishimoto with a detergent along with an aqueous rinse because such is known in the art, as taught by Landrock (see above), and this removes any contaminants from the surfaces that could interfere with the treating and bonding steps.

### ***Double Patenting***

18. Claims 1-21 of this application conflict with claims 1-21 of Application No. 10/255,926. 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one

Art Unit: 1733

application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP § 822.

19. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

20. Claims 1, 3, 7, and 15 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6-8, 10, 15-16, 24-26, 28, 36-38, and 41-46 of copending Application No. **10/255,777 and 10/035,358** (claims in both applications are identical. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the copending application encompass the limitations set forth in the present application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

21. Claims 2, 8, and 11-12 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6-8, 10, 15-16, 24-26, 28, 36-38, and 41-42 of copending Application No. 10/255,777 and 10/035,358 in view of *Eda*. Applicants are directed to the paragraphs above for a complete discussion of these references.

Art Unit: 1733

This is a provisional obviousness-type double patenting rejection.

22. Claim 4 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6-8, 10, 15-16, 24-26, 28, 36-38, and 41-42 of copending Application No. 10/255,777 and 10/035,358 in view of Eda and Landrock. Applicants are directed to the paragraphs above for a complete discussion of these references.

This is a provisional obviousness-type double patenting rejection.

23. Claims 5-6 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 6-8, 10, 15-16, 24-26, 28, 36-38, and 41-42 of copending Application No. 10/255,777 and 10/035,358 in view of Eda, Landrock, and Shiono et al. Applicants are directed to the paragraphs above for a complete discussion of these references.

This is a provisional obviousness-type double patenting rejection.

24. Claim 9 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6-8, 10, 15-16, 24-26, 28, 36-38, and 41-42 of copending Application No. 10/255,777 and 10/035,358 in view of Eda, Landrock, and Rangsten. Applicants are directed to the paragraphs above for a complete discussion of these references.

This is a provisional obviousness-type double patenting rejection.

25. Claim 10 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6-8, 10, 15-16, 24-26, 28, 36-38, and 41-42 of copending Application No. 10/255,777 and 10/035,358 in view of Eda, Landrock,

Rangsten et al., and Shin et al. Applicants are directed to the paragraphs above for a complete discussion of these references.

This is a provisional obviousness-type double patenting rejection.

26. Claim 13 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6-8, 10, 15-16, 24-26, 28, 36-38, and 41-42 of copending Application No. 10/255,777 and 10/035,358 in view of Eda and Sayah et al. Applicants are directed to the paragraphs above for a complete discussion of these references.

This is a provisional obviousness-type double patenting rejection.

27. Claim 14 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6-8, 10, 15-16, 24-26, 28, 36-38, and 41-42 of copending Application No. 10/255,777 and 10/035,358 in view of Eda and Ramsey et al. Applicants are directed to the paragraphs above for a complete discussion of these references.

This is a provisional obviousness-type double patenting rejection.

28. Claims 16-17 and 21 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6-8, 10, 15-16, 24-26, 28, 36-38, and 41-42 of copending Application No. 10/255,777 and 10/035,358 in view of Eda, Landrock, Shiono et al., and Vines et al. Applicants are directed to the paragraphs above for a complete discussion of these references.

This is a provisional obviousness-type double patenting rejection.

29. Claim 18 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6-8, 10, 15-16, 24-26, 28, 36-38, and 41-42 of copending Application No. 10/255,777 and 10/035,358 in view of Eda, Landrock,

Shiono et al., Vines et al., and Sayah et al. Applicants are directed to the paragraphs above for a complete discussion of these references.

This is a provisional obviousness-type double patenting rejection.

30. Claim 19 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6-8, 10, 15-16, 24-26, 28, 36-38, and 41-42 of copending Application No. 10/255,777 and 10/035,358 in view of Eda, Landrock, Shiono et al., Vines et al., Sayah et al, and Rangsten et al. Applicants are directed to the paragraphs above for a complete discussion of these references.

This is a provisional obviousness-type double patenting rejection.

31. Claim 20 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6-8, 10, 15-16, 24-26, 28, 36-38, and 41-42 of copending Application No. 10/255,777 and 10/035,358 in view of Eda, Landrock, Shiono et al., Vines et al., Sayah et al, Rangsten et al., and Shin et al. Applicants are directed to the paragraphs above for a complete discussion of these references.

This is a provisional obviousness-type double patenting rejection.

32. The same rejections as those set forth in paragraphs 20-31 above can be set forth for claims 1-21 of the present application using claims 5-10, 16-18, 25-28, and 30-32 of copending US Application Serial No. **10/035,659**.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Jessica L. Rossi** whose telephone number is **703-305-5419**. The examiner can normally be reached on M-F (8:00-5:30) First Friday Off.

Art Unit: 1733

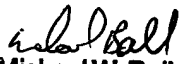
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael W. Ball can be reached on 703-308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jessica L. Rossi  
Patent Examiner  
Art Unit 1733



jl  
July 25, 2003

  
**Michael W. Ball**  
**Supervisory Patent Examiner**  
**Technology Center 1700**